UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,730	08/14/2008	Thomas Berthold	PC10910US	2816

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EXAMINER
PARK, HYUN D

ART UNIT	PAPER NUMBER
2863	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/593,730	BERTHOLD ET AL.
	Examiner	Art Unit	
	HYUN PARK	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08/14/2008</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>12-22</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>12-22</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>21 September 2006</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>09/21/2006</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____ .

DETAILED ACTION

Regarding Claims: 1-11 Cancelled.

Claim Rejections - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2.   Claims 12-22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 12-22 are directed to calculating the total restoring torque and lateral forces, but do not specify what is doing the calculating. Since the calculations can be done by hand or a computer, these claims are not statutory.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

5.   Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Smith, "Understanding Parameters Influencing Tire Modeling,") (hereinafter Smith) in

view of Ono et al., US-PGPUB, 2004/0133330 (hereinafter Ono).

Regarding Claim: 12. Smith discloses a method for calculating the lateral force

in a motor vehicle with an electromechanical or electrohydraulic steering system, the

method comprising:

calculating a total restoring torque from the steering rod force, with the said restoring

torque comprising a restoring torque generated by lateral force and other restoring

torques; quantitatively determining the other restoring torques based on measured

values (*pg. 7, "Self-Aligning Torque" section, Equations 20-21; the total self-aligning or

restoring torque is the torque due to lateral and vertical forces*).

subtracting the other restoring torques from the total restoring torque for determining the

restoring torque generated by the lateral force (*since the total restoring torque is T(total)*

= *T(lateral) + T(vertical), torque due to the lateral forces is T(lateral) = T(total) -*

T(vertical), which is the Equation 20).

and determining the lateral force from the restoring torque generated by the lateral force

(*the lateral forces can be determined from using the Torque-lateral force Equation 20*).

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to use the Torque-Lateral force equation (Equation 20) to determine the

lateral force, since the lateral force is a well known parameter critical to the directional

control and stability of the vehicle.

Smith does not disclose recording a steering rod force;

Ono discloses self-aligning torque calculating apparatus, which consists of the steering

torque (or force) detection portion, which is used to accurately determine one of the

parameter (namely the surface friction state) related to the stability of the vehicle (*Fig. 2;*

Paragraph [0007])

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to use Ono's self-aligning torque apparatus and method, which includes

the Steering Torque detection portion (**21; *Fig. 2***) in the method of Smith to accurately

record the steering torque as taught by Ono, and thereby accurately calculate the lateral

force in the determination of optimal vehicle stability and control.

Regarding Claim: 13-14. Smith discloses a transmission ratio (which is

responsive to a steering angle) between the steering rod force and the total restoring

torque is included in the determination of the lateral force (*pg. 7, "Pneumatic Trail,"*

section, Equations 22-23).

Regarding Claim: 15. Smith discloses a kingpin inclination, a caster angle or a

combination thereof (*pgs. 6-7, "Self-aligning" section).*

Although the parameters kingpin inclination and caster angle are not included in

the self-aligning torque and lateral force approximate calculations of Smith, it would

have been obvious to a person of ordinary skill in the art to include the said parameter

in the calculation of the lateral force with greater accuracy since these are well known

parameters related to the lateral force and consequently the stability and control of the

vehicle.

Regarding Claim: 16. Smith discloses the other restoring torques comprise one

or more of a restoring torque generated by a vertical force (*pg. 7, "Self-Aligning*

Torque," section, Equation 21).

Regarding Claims: 17-19. Smith does not disclose the total steering rod force is calculated from a steering torque generated by the driver, a steering amplification, and a steering ratio

Ono discloses the total steering rod force is calculated from a steering torque generated by the driver, a steering amplification, and a steering ratio (Fig. 2; *Paragraph [0033]; power steering device is the steering with amplification, and the steering torque is inherently generated by the driver and a steering-angle-responsive steering ratio*)

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use Ono's self-aligning torque apparatus and method, which includes a total steering rod force (or torque) generated by the driver, a steering amplification, and a steering ratio, in the method of Smith to accurately record the steering torque as taught by Ono, and thereby accurately calculate the lateral force in the determination of optimal vehicle stability and control.

Regarding Claim: 20. Smith does not disclose the total steering rod force is determined from the motor current and/or the motor position of one or more electric motors of the electromechanical or electrohydraulic steering system

Ono discloses total steering rod force (or torque) determined from the motor current

and/or the motor position of one or more electric motors of the electromechanical or

electrohydraulic steering system (*Fig. 2; Paragraph [0027]*).

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to use Ono's self-aligning torque apparatus and method, which includes

the total steering rod force (or torque) determined from the motor current and/or the

motor position of one or more electric motors of the electromechanical or

electrohydraulic steering system, in the method of Smith to accurately record the

steering torque as taught by Ono, and thereby accurately calculate the lateral force in

the determination of optimal vehicle stability and control.

Regarding Claim: 21. Smith discloses determining sideslip angle from the

determined lateral force (*pgs. 3-4, "Slip Angle," section, Equations 2 and 4; pg. 6, "Total*

Lateral Force" subsection).

Regarding Claim: 22. Smith does not disclose coefficient of friction being

determined from the determined lateral force.

Ono discloses calculating coefficient of friction (Fig. 2).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use Ono's self-aligning torque apparatus and method in the method of Smith to accurately calculate the coefficient of friction as taught by Ono.

Conclusion

6.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tonuk et al., Prediction of automobile tire cornering force charateristics by finite element modeling and analysis," Computers and Structures 79 (2001).

Sommerer et al., US Pat No. 5,415,427 "Wheel suspension system," discuses the **caster angle and its affect on the camber and the lateral force.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HYUN PARK whose telephone number is (571)270-7922. The examiner can normally be reached on 8-4 PM, M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571)272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. P./

12/07/2009

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Drew A. Dunn
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